

## CLAIMS:

1. A check valve for a fuel pump of a vehicle comprising:
- 5 a valve housing adapted to be disposed in an outlet member of the fuel pump;
- a valve seat formed on said valve housing;
- a valve member disposed in said valve housing and having a closed position to engage said valve seat to
- 10 prevent fuel from flowing through the outlet member and an open position to allow fuel to flow through the outlet member; and
- said valve member having at least one outlet port a predetermined dwell distance from said valve seat when
- 15 said valve member is in said closed position and allowing fluid flow past said valve seat when said valve member is in said open position.
2. A check valve as set forth in claim 1
- 20 wherein said valve member has a hub and a stem extending axially from said hub.
3. A check valve as set forth in claim 2 wherein said valve housing has a passageway extending
- 25 axially therethrough to receive said stem.

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Claim  
4. A check valve as set forth in claim 2 including a flow tube at one end of said valve housing adjacent said valve seat.

5 5. A check valve as set forth in claim 2 wherein said valve housing has an enlarged opening at one end of said passageway.

6. A check valve as set forth in claim 5  
10 wherein said valve member has a flange at one end of said stem opposite said hub and disposed in said enlarged diameter portion.

7. A check valve as set forth in claim 2  
15 wherein said valve member has a flow port extending axially therein.


8. A check valve as set forth in claim 6  
wherein said at least one outlet port extends radially in  
20 said valve member and communicates with said flow port.

4 9. A check valve as set forth in claim 1 wherein said at least one outlet port has a metered shape.

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10. A check valve as set forth in claim 1 wherein said valve member has an annular groove extending radially therein.

5 11. A check valve as set forth in claim 10 including a seal disposed in said groove for contacting said valve seat when said valve member is in said closed position.

10  12. A check valve as set forth in claim 11 including a spring disposed about said valve member to urge said seal and said valve member toward said valve seat.

13. A check valve for a fuel pump of a vehicle  
15 comprising:

a valve housing adapted to be disposed in an outlet member of the fuel pump, said valve housing having a passageway extending axially therethrough;

a valve seat formed on said valve housing to one  
20 end of said passageway;

a valve member disposed in said passageway of said valve housing and having a closed position to engage said valve seat to prevent fuel from flowing through the outlet member and an open position to allow fuel to flow  
25 through the outlet member; and

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5 said valve member having a flow port extending  
 therein with at least one outlet port a predetermined dwell  
 distance from said valve seat when said valve member is in  
 said closed position and allowing fluid flow past said  
 valve seat when said valve member is in said open position.

14. A check valve as set forth in claim 13  
 including a flow tube at one end of said valve housing  
 adjacent said valve seat.

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4 15. A check valve as set forth in claim 13  
 wherein said at least one outlet port has a metered shape.

15 16. A check valve as set forth in claim 13  
 wherein said valve member has an annular groove extending  
 radially therein.

20 17. A check valve as set forth in claim 16  
 including a seal disposed in said groove for contacting  
 said valve seat when said valve member is in said closed  
 position.

25 18. A check valve as set forth in claim 13  
 wherein said valve housing has an enlarged opening at one  
 end of said passageway and said valve member has a flange  
 at one end and disposed in said enlarged diameter portion.

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19. A check valve as set forth in claim 18 including a spring disposed about said valve member between said flange and surface of the enlarged diameter portion to  
5 urge said valve member toward said valve seat.

20. A check valve for a fuel pump of a vehicle comprising:

a valve housing adapted to be disposed in an  
10 outlet member of the fuel pump, said valve housing having a body portion with a passageway extending axially therethrough;

a valve seat formed on said valve housing to one end of said passageway;

15 a valve member disposed in said passageway of said valve housing and having a closed position to engage said valve seat to prevent fuel from flowing through the outlet member and an open position to allow fuel to flow through the outlet member;

20 said valve member having an annular groove extending radially therein;

a seal disposed in said groove for contacting said valve seat when said valve member is in said closed position;

25 said valve housing having an enlarged opening at one end of said passageway and said valve member has a

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flange at one end and disposed in said enlarged diameter portion;

a spring disposed about said valve member between said flange and surface of the enlarged diameter portion to urge said seal and valve member toward said valve seat; and said valve member having a flow port extending therein with at least one outlet port a predetermined dwell distance from said valve seat when said valve member is in said closed position and allowing fluid flow past said valve seat when said valve member is in said open position.

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